

REMARKS

Applicant thanks the Examiner for indicating the allowability of claims 131-152. Claims 1-123 are canceled. Claims 124, 129, 130, 136, 141, 147 and 152 are amended. Claims 124-152 are pending in the present application.

Claims 129, 130, 136, 141, 147 and 152 stand objected to because of certain informalities. The dopant concentrations in claims 129, 130, 136, 141, 147 and 152 have been amended to recite concentrations of "ions/cm³." In light of this amendment, Applicant submits that claims 129, 130, 136, 141, 147 and 152 are in condition for allowance and respectfully requests that the objection be withdrawn.

Claim 124-128 stands rejected under 35 U.S.C. § 102(c) as being anticipated by U.S. Patent No. 6,331,873 ("Burke"). Applicant respectfully traverses this rejection.

Claim 124, as amended, recites a "method of forming a CMOS imager substrate" comprising "providing a semiconductor substrate having a doped layer of a first conductivity type with a first dopant concentration" and "forming a shallow contiguous buried doped region of a second conductivity type with a second dopant concentration, beneath the entire surface of said semiconductor substrate, *wherein said second dopant concentration is greater than said first dopant concentration.*" Emphasis added. Burke does not disclose all of the limitations of claim 124.

Burke discloses a "blooming control structure for an imager" (Abstract) having "a lightly-doped p-type silicon substrate 42" and "N-type buried channels 14a, 14b are provided for collection of the photogenerated electrons." Col. 7, lines 28-34; Fig. 2. According to Burke, the "substrate is typically lightly doped, at about, e.g., 10¹⁴ to 10¹⁵ cm³, and the buried channels are also of a relatively light doping, e.g., about 10¹⁶ cm³." Col. 7, lines 55-57. Hence, Burke discloses forming buried channels with a dopant concentration that is *less* than the dopant concentration of the doped substrate, and not "forming a shallow contiguous buried doped region of a second conductivity type with a

second dopant concentration, wherein said second dopant concentration is *greater* than said first dopant concentration,” as recited in claim 124. Since Burke does not disclose all the limitations of claim 124, Burke does not anticipate claim 124 or claims 125-128 depending therefrom. Accordingly, Applicant respectfully requests that the 35 U.S.C. § 102(e) rejection of claims 124-128 be withdrawn.

Claims 129 and 130 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Burke. Applicant respectfully traverses this rejection.

Claims 129 and 130 depend from claim 124. As discussed above, Burke does not disclose all the limitations of claim 124. Burke also does not teach or suggest all the limitations of claim 124. In fact, Burke specifically teaches away from claim 124. As mentioned, Burke teaches that while the “substrate is typically lightly doped, . . . the buried channels are also of a relatively light doping,” and provides dopant concentrations of the substrate that are higher than the dopant concentration of the buried channels. Col. 7, lines 55-57. By contrast, claim 124 recites that “second dopant concentration [of the buried channels] is greater than said first dopant concentration [of the substrate].” Since Burke teaches the opposite of what is claimed in claim 124, Burke does not teach or suggest the limitations of claim 124, or claims 129 and 130 depending therefrom. Moreover, the Office Action acknowledges the fact that “Burke et al do not teach ranges of concentrations for both buried region and doped layer,” while claim 129 recites “a dopant concentration of from about 1×10^{11} ions/cm³ to about 1×10^{13} ions/cm³” and claim 130 recites a dopant concentration of from about 1×10^{14} ions/cm³ to about 5×10^{16} ions/cm³.” Thus, Burke does not teach or suggest the limitations of claims 129 and 130. Accordingly, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection of claims 129 and 130 be withdrawn.

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In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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